Space Weather Forecast

Issued on Friday 28 March 2025 at 01:14 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor geomagnetic storms intervals. Chance of Moderate flares (Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity reached Moderate-class due to an isolated low level Moderate-flare from a small bipolar region in the northeast at 27/0037 UTC. There are currently five numbered sunspot regions on the Earth-facing solar disc, most small, weak and magnetically simple. The region that generated the Moderate flare remains the most significant region, with some slight magnetic complexity. A new and unnumbered region is emerging on the northeast limb, and currently appears to be a mature, stable unipolar spot.

A small filament eruption occurred near centre disc, around 27/1115 UTC. Currently an associated CME has not been observed, although available chronograph imagery is limited. If a CME had been generated then it would potentially have an Earth directed component.

A larger filament eruption occurred around 27/2200 UTC from the southeast quadrant. The associated CME will be analysed for any Earth directed component once adequate imagery is available, but currently this CME is not expected to be Earth directed.

Solar Wind / Geomagnetic Activity: Solar wind parameters continued to show the influence of a high speed stream (HSS) due to a connection with a large coronal hole feature. Initially strong speeds increased to reach very strong levels during the morning of the 27th, peaking at 870 km/s at 27/0730 UTC. Since then a slight decline has occurred, with solar winds currently back to strong levels around 780 km/s. The strength of the solar wind's magnetic field started at strong levels but since then has steadily declined to end the day at weak levels. The important north-south component initially fluctuated between strong positive (northward) and moderate negative (southward) orientation, then declined to weak levels while also favouring a positive (northward) orientation. Geomagnetic activity was predominantly Active to Minor geomagnetic storm levels.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is expected, with a chance of further isolated Moderate class flares, probably from the sunspot region in the northeast of the solar disc.

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However, new or returning regions are expected through the forecast period and may increase the solar activity.

Solar Wind / Geomagnetic Activity: No clear Earth-directed coronal mass ejections feature in the forecast, though an eruption on 25th may give a slight chance of a glancing blow on either days 2 or 3 (29 or 30th Mar), although this carries low confidence. Currently only one of the two filament eruptions on the 27th appears to have generated a CME, which is awaiting analysis once adequate imagery is available. At present this CME is thought unlikely to have an Earth directed component, due to it's origin in the southeast quadrant and initial indications of having a strong southward component.

Solar winds are currently strong, around 770km/s, due to the HSS related to the unusually prominent positive coronal hole feature which dominates a large portion of the southern hemisphere. Solar winds are expected to remain strong through much of today (28th) and then gradually decline to slightly elevated levels for day 4 (31st Mar).

Mainly unsettled to active levels are expected today (28th), with a chance of isolated Minor Geomagnetic storm intervals. Geomagnetic activity is then expected to steadily decline, becoming Quiet to Unsettled through tomorrow (29th) but with a chance of isolated Active levels at first. Mainly Quiet activity is expected by day 4 (31st).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, with a slight chance of enhancement from any larger flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	Yes	50	30	20	10
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

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Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	30	30	30	30
Very Active	R3-R5 (X Class)	No	1	1	1	1

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	1	1	1	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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